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Memo

date: *Thursday, February 10, 2000*

to: *All C-A Users*

from: *D. I. Lowenstein*

subject: *FY00 C-A ESH REQUIREMENTS BRIEFING FOR USERS*

The attached material is a briefing about the environmental, safety and health (ESH) requirements applicable to members of experimental groups (Users) who plan to work in C-A experimental areas. As an introduction to C-A requirements, Users must read this information and subsequently meet the training requirements described herein. Further discussion of ESH topics can be arranged by contacting the C-A ESHQ Division Head (Ray Karol, x5272, Beeper 5817) or Deputy ESHQ Division Head (Bill Sims, x3271, Beeper 4210).

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Attachment

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PERTINENT TELEPHONE NUMBERS

C-A Department Chair	Derek Lowenstein	4611
C-A Associate Chair For ESHQ	Ed Lessard	4250
C-A ESHQ Division Head	Ray Karol	5272
C-A ESHQ Deputy Division Head	Bill Sims	3271
C-A ES&H Coordinator	Asher Etkin	7200
C-A ES&H Coordinator	Lori Stiegler	4617
C-A Facility Support Representative	Chuck Schaefer	4728
C-A Environmental Coordinator	Pete Stillman	7520
C-A Training and Procedures Manager	Jim Licari	7146
C-A Main Control Room	Operations Coordinator	4662
C-A Work Control Manager	Peter Cirnigliaro	5636
Health Physics Office at C-A	On-Duty RCT	4660
BNL Laser Safety Officer	Chris Weilandics	2593
BNL Clinic	On Duty Staff	3670
Experimental Safety Review Committee	Yousef Makdisi (Chair)	4932
Radiation Safety Committee	Dana Beavis (Chair)	7124
Accelerator Safety Review Committee	Woody Glenn (Chair)	4770

FIRE OR MEDICAL EMERGENCY…2222

C-A ESHQ WEB SITE… http://www.rhichome.bnl.gov/AGS/Accel/SND/

TRAINING REQUIREMENTS

Before each running period, you must attend a classroom version of C-A Users Training, **or** re-qualify each year by taking the challenge exam. C-A Users Training incorporates General Employee Training, General Employee Radiological Training, Environmental Management System Computer Based Training, Stop Work Training, RHIC Access Training and Work Planning Training. If additional training requirements are needed for specific individuals, then the C-A Experimental Safety Review Committee or the C-A Radiation Safety Committee will identify them during the experiment review process.

C-A Users Training is in addition to training requirements for Collider Experiment Shift Leaders, and does not replace the other training requirements associated with that special job category. If you are not a Collider Experiment Shift Leader, then C-A Users Training is the only training requirement you must fulfill.

Typically, the 1.5-hour classroom program starts six to eight weeks before the onset of the experimental running period. The classroom program is given every Monday at 10:30 a.m. in the Snyder Seminar Room, Building 911-A. If you have previously attended the classroom program, you may elect to take a challenge exam. *However, for FY00, all Users must attend classroom training.* For FY01 and beyond, contact the Training Office, x5800 to arrange for the challenge exam.

Please note that personal-radiation dosimeters (TLDs) are **not** required for most Collider experiment Users at this time.

If you are a Collider Experiment Shift Leader, then you will need a TLD. In order to be issued a TLD, Radiation Worker I Training is required every other year. This course is given on alternate Tuesdays from 9:00 a.m. to 3:30 p.m. by the ESH&Q Division in the Building 129 Training Room. If you have already taken the classroom program, you may take a challenge exam to re-qualify. Contact Valerie Bryant x7007, or Jim Licari x7146. If you have valid Radiation Worker I Training from another DOE Laboratory, then you do not have to take the BNL Radiation Worker I Training.

Please read the following synopsis of ESH requirements at C-A. Every User is responsible for knowing and observing the requirements.

REPORTING ESH ISSUES

In C-A experimental areas, the potential exists for serious accidents. There are latent hazards posed by heavy mechanical equipment, high-voltage high-current electrical systems, flammable gases, oxygen deficiency and radiation. Although we have maintained an excellent ESH record in such a complex environment, the participation of each User who has access to experimental areas is necessary. We want each User to be familiar with our ESH regulations and procedures.

If you observe any potential hazards or ESH problems, please report it to the Operations Coordinator in the C-A Main Control Room (x4662) as soon as possible or to the C-A ESHQ Division Head (x5272).

Users will find detailed written information on ESH requirements for reviewing experiments by linking to C-A procedure OPM 9.2.1. The C-A Department requires Experiment Spokespersons to review their experiments against BNL requirements, which are located in the Subject Areas Section of the BNL Standards Based Management System (SBMS), and to receive formal approval for experiment startup.

Your liaison physicist works directly with members of the C-A ESHQ Division, the C-A ESRC Chair and C-A RSC Chair to ensure the safe and environmentally sound operation of your experiment. Your liaison physicist is your main contact person for ESH related issues. A list of liaison physicists is located at: http://www.rhichome.bnl.gov/AGS/Accel/SND/Liaisons/liaisons.html.

Your experiment also has a liaison engineer who coordinates the installation of large experimental components within the experimental hall and the interfaces with C-A utilities. The liaison engineer works with Users, designers and the trades-people to meet BNL's ESH design and installation requirements including work planning requirements.

The Laboratory policy is to protect the health and safety of employees, Users and the public. The C-A Department Chair and the C-A Associate Chair for ESHQ are responsible for the implementation of formal ESH programs at the C-A. The C-A ESHQ Division Head carries out this program on a day-to-day basis. *However, it is important to recognize that **you** are responsible for your own safety, and that you will be held personally accountable if you do not follow C-A requirements.* We note that your liaison physicist is most familiar with C-A requirements.

Normal communications regarding ESH issues should go through your liaison physicist; e.g., shielding modifications, beam intensity changes, tours, visitor requirements and training.

SUMMARY OF ESH REQUIREMENTS AT C-A

Injuries

All injuries that occur at the Laboratory of such severity as to require first aid or a physician's treatment should be reported to the BNL Occupational Health Clinic (x3670). If a medical emergency occurs while working in the experimental areas, then also notify the Main Control Room (C-A Main Control Room, x4662). Emergency medical assistance is always available by calling x911.

Equipment Hazards

Any potential hazards associated with experimental equipment problems should be reported to the on-duty Operations Coordinator (x4662) and your liaison physicist as soon as possible.

Visitors and Minors

The Experiment Spokesperson is responsible for all personnel visiting your experiment. A fully trained C-A User must accompany visitors. The Head or the ESHQ Division and the liaison physicist must be notified of any tours you arrange for groups of visitors.

Individuals under 18 years of age are not permitted in the experimental areas without the permission of the C-A Chair, C-A Associate Chair for ESHQ or C-A ESHQ Division Head.

ESH Reviews

Your liaison physicist must be notified beforehand about all materials, chemicals or equipment that you bring into the C-A. Each experiment or modification to the experiment must undergo a review for conventional ESH issues by the **C-A Experimental Safety Review Committee (Y. Makdisi, Chair, x4932)**. Sufficient drawings and certifications must be made available for review of equipment that is fabricated at a non-BNL facility. The **C-A Radiation Safety Committee (D. Beavis, Chair, x7124)** may also review the experiment for access controls and radiation protection issues if significant changes to the experimental area or beam are required.

Certain types of equipment, such as pressure vessels, vacuum vessels, cryostats, and gas handling systems must not be operated before undergoing a thorough ESH review. Your liaison physicist must be informed before the introduction of a potential hazard into the experimental areas so that a determination of the need for an ESH review can be made. Sufficient time must be allowed for modifications to be accomplished prior to operation of the equipment.

Radiation Safety

GOLDEN RULES FOR RADIOLOGICAL AREAS AT C-A

Do not climb over or defeat barriers.

Do not ignore radiological signs, labels, alarms, warnings or posted entry requirements especially a posted requirement to wear a TLD.

Radiation safety requirements for specific experiments have been established and posted for each experimental area. Please be sure to read the posted rules and follow them.

TLD badges may be required in certain experimental areas. If the area is posted as a "Radiation Area" or posted as "Controlled Area TLD Required," then you must have RadWorker I Training, C-A User Training and a TLD badge to enter. These additional requirements will be clearly indicated on the sign. You may also be escorted and you may wear a visitor TLD in a "Radiation Area" or "Controlled Area TLD Required."

If the area is posted as "Controlled Area," such as at the Collider experiments, then you must have C-A User Training, but RadWorker I Training and a TLD are **not** required.

Do not linger in radiological areas if you are not assigned to work in radiological areas.

Area radiation monitors, commonly called "chipmunks," are provided in experimental areas. Please **DO NOT MOVE OR TAMPER WITH THESE MONITORS.**

Fetal radiation dose is subject to special radiation limits. Declared pregnant C-A Users are subject to special restrictions on total radiation exposure while working at the C-A. Please inform the Facility Support Representative, C. Schaefer (x4728), so that your work locations can be evaluated.

All radioactive sources must be reviewed and surveyed by a C-A ESHQ Radiological Control Technician (x4660) in order to check that the source does not leak. If you are bringing a source to the C-A, contact the C-A Health Physics Office (x4660) before the source arrives, even if you are bringing it from another BNL Department or Building. Offsite sources must always be shipped to and from C-A Department via the BNL Isotopes and Special Materials Group (x5233).

Please be aware that it is our policy that **no** eating or drinking is permitted in Radiation Areas.

Access Control Rules

Do not climb fences or barriers. **YOU MUST ENTER YOUR EXPERIMENTAL AREA THROUGH A GATE AT ALL TIMES.** This will ensure beam is safely off. Failure to follow this rule will result in your being denied access to the BNL site.

Do not remove, deface or otherwise alter a radiological barrier.

Obey all posted requirements. Do not enter areas that are posted as **High Radiation Areas** or **Contamination Areas**. Training beyond that of User Training and Radiation Worker I Training is required to enter these areas.

Follow all instructions on **orange-colored** Security System tags which are found on "chipmunks," certain power supplies, and other equipment that is interfaced with the access control system.

Fire Safety

Smoking is not allowed in any C-A building.

Learn the location of the fire alarm pull-box for your area. In case of fire or any other emergency call x911 or pull the fire alarm and then notify the Main Control Room (x4662). All telephones have a location label.

Learn the local emergency procedures for your experiment, if any. Certain experiments have formal emergency procedures. Consult with your liaison physicist or Experiment Spokesperson.

The C-A complex must be evacuated immediately when you hear a pulsating siren and/or hear the continuous or intermittent ringing of fire alarm bells. Once out of the building, personnel should remain clear of the C-A experimental buildings. A public announcement will be made when it is safe to re-enter the experimental area.

Evacuation routes inside the experimental areas are sometimes complicated. Be sure that you know your way quickly out of the building. Please help to keep exit ways free of obstructions.

Do not place yourself at risk by attempting to fight a fire **only** with a portable extinguisher. Call the Fire Department (x911) and Main Control Room (x4662) first, and then use the extinguisher.

Automatic fire extinguishing systems are installed in some experimental areas. If you are present when a system discharges, condensation in the room or enclosure may cloud the area and it is advisable to leave the area once the system has discharged. The gases are, however, not a danger to your health. Discharge time is normally 10 seconds or less.

Experimental equipment using flammable gases or liquids require a ESH review prior to operation. It is important to be aware of the additional C-A Department requirements established for this type equipment.

Combustible materials, such as paper, cardboard boxes, wooden material, etc., should not be allowed to accumulate in experimental areas.

Cryogenic Fluids

Do not smoke or create ignition sources near hydrogen or deuterium reservoirs, dewars, transfer lines or other equipment containing flammable cryogenic fluids.

Exercise extreme caution if it is necessary to work in the immediate vicinity of a liquid H_2 target or vessel.

Cryogenic fluids can cause serious burns if spilled on tissue. Gloves and goggles are required when handling cryogenic liquids.

Cryogenic fluid spills can create oxygen deficient atmospheres. Obey all cryogenic alarms and leave the area if a spill is occurs. Do not travel though the vapor cloud since the extremely cold air may harm lung tissue.

Work Planning

Users are required to file work plans before beginning work at C-A facilities. The procedure for Work Control for Experimenters, OPM 2.29, provides the details for preparing a list of pre-approved Low-Hazard tasks. This list is prepared and posted by the Experiment Spokesperson, or his/her designate, and the C-A Work Control Manager. Users who perform tasks not included on the list should contact the liaison physicist or liaison engineer to determine if additional ESH review of the task is warranted.

Performance of Moderate or High-Hazard tasks must meet the requirements in BNL Standard 1.3.6 for Work Planning, which entails obtaining an authorization using BNL's "Green Work Permit." A list of tasks classified as Moderate or High Hazard is given in C-A OPM 2.28.c. Working on flammable gas systems, working at heights or work around large vacuum windows may fall in the Moderate or High Hazard categories, and your liaison engineer or liaison physicist should be contacted to assist in the initial stages of work planning.

Certain experimental collaborations have additional work planning requirements, and may even have experimental "work coordinators." Consult with your liaison physicist or Experiment Spokesperson regarding local work planning rules before starting a task in the experimental area.

Electrical Safety Rules

In addition to the hazards of contact with energized electrical circuits, the short-circuit capacity of the 120/208 and 480-volt systems is much above that encountered at most industrial and/or research facilities. **Connection and disconnection to a C-A power distribution system that requires tools must be made only by qualified BNL personnel.** Please be cautious when working on equipment that has been connected to the 120/208 and 480-volt systems; a short circuit can produce a large arc, with a resultant molten metal spray.

Do not work on electrical equipment that is energized with 1) greater than 50 V ac rms, 2) greater than 50 V dc, 3) greater than 10 ma of available current or 4) greater than 10 joules of energy. Contact the C-A Training and Procedures Manager (x7146) to complete additional electrical safety training requirements before beginning electrical work of this nature.

The **red hold tag** is used for protection of personnel, and the equipment to which it is attached should never be operated. **Only the person who attached the tag may remove**

it. In the event this person is not available, a special review process can be initiated by C-A Main Control (x4662).

Magnetic Field Safety

Use extreme caution with iron and steel objects when working around magnets, especially those magnets with large gaps. Be sure you do not inadvertently energize a magnet before the area is clear. Remember that the field may be effective at a surprisingly long distance.

Obey warning signs regarding pacemakers, and respect local Magnetic Safety Plans and barriers, if any.

Large spectrometer magnets require an ESH review before initial turn on and following any modifications to adjacent apparatus or shielding.

Vacuum Windows

Be sure a vacuum window shutter is in place when working around a large vacuum windows. Remember that an air hammer may cause significant equipment damage and personnel injury should you be a few feet from a failed window.

Laser Requirements

All lasers in the experimental areas need to be reviewed by the BNL Laser ESH Officer, Chris Weilandics, x2593, before initial use or following modification to a previously reviewed laser. Make sure that you are aware of the ESH requirements, including medical surveillance requirements, established for the laser(s) in your area.

Waste Rules and Pollution Prevention

Each User is responsible to handle, accumulate or dispose of radioactive or hazardous waste using adequate controls and documentation, and appropriate training. While your liaison physicist or liaison engineer may be knowledgeable in ESH rules, waste rules and waste-handling forms are complex, change frequently, and your waste may require special handling and labeling. You must contact the C-A Environmental Coordinator (x7520) for assistance in removing all waste from C-A.

Minimize the amount of waste generated by: 1) substituting re-usable materials where possible, 2) irradiating minimum quantities of materials, and 3) segregating different wastes to allow for reclamation.

Do not put ordinary waste in Radioactive Waste cans. This would increase the radioactive waste burden.

Lists of pollution prevention techniques and products requiring recycling are located at https://sbms.bnl.gov/standard/08/0800t011.htm

Stop-Work

Any User who reasonably concludes that an *imminent danger* exists and that immediate action is required to mitigate the danger is obliged to take action to stop work. An *imminent danger* exists if proceeding with work could result in death, serious injury, or significant unexpected environmental or equipment damage. Stopping work is a simple procedure and is as follows:

1. The initiator of a Stop-Work order for *imminent danger* shall state the following: "*Stop work! You are in imminent danger because…"*
2. Any person receiving a Stop-Work order shall stop work immediately, if that can be done safely, or at the first opportunity to stop safely.
3. The person issuing a Stop-Work order MUST NOT verbally or physically interfere, whether or not the recipients of the Stop-Work order continue to work.
4. The person issuing and the person receiving the Stop-Work order shall notify their liaison physicist or supervisor and the C-A ES&H Coordinator that a Stop-Work order was issued, and of the nature of the *imminent danger* that exists.

Additional information on Stop Work is provided during C-A Users Access Training.

Miscellaneous

Do not walk under or stand near objects being handled by the cranes.

Do not create trip hazards. Keep areas and aisles free of obstructions. In case of doubt, consult your liaison physicist.

The use of solvents, lead, beryllium or other toxic materials requires personal protective equipment. Consult with your liaison physicist or a C-A ESH Coordinator (x7200 or x4617) for requirements.